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## DEODORANT

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[There are no amendments to this patent.]

### Abstract

#### Objective

To provide a deodorant that exerts an excellent fast-acting deodorizing effect on odors, in particular, an organic acid group odor and is not unpleasant after use.

#### Constitution

The deodorant includes at least one kind of refined plant oil or its component selected from a group comprised of lemongrass oil, orange oil, lemon oil, linalool, menthol, borneol, linalyl acetate, benzyl benzoate, citral, decylaldehyde, and terpinolene.

## Claims

1. A deodorant characterized by the fact that in a deodorant for an organic acid group odor, it includes at least one kind of refined plant oil or its component selected from a group comprised of lemongrass oil, orange oil, lemon oil, linalool, menthol, borneol, linalyl acetate, benzyl benzoate, citral, decylaldehyde, and terpinolene.

2. The deodorant of Claim 1, wherein the total content of refined plant oil or its component is 0.001-10 wt% to the entire deodorant.

3. The deodorant of Claim 1 or 2, wherein 0.01-20 wt% of a component having a chemical deodorizing effect is included to the entire deodorant.

4. The deodorant of any of Claims 1-3, wherein 1-50 wt% liquid paraffin is included to the entire deodorant.

5. The deodorant of any of Claims 1-4, wherein 0.001-1 wt% antibiotic is included to the entire deodorant.

## Detailed explanation of the invention

[0001]

### Industrial application field

The present invention pertains to a deodorant that can deodorize offensive odors and foul odors, in particular, an organic acid group odor such as valeric acid and butyric acid, which are the main components of skin odor generated in a shaver

(electrical razor), sweat odor, body odor, and abnormal odor of socks by a sensually neutralizing action.

[0002]

Prior art

In general, as offensive odors and abnormal odors, discharged smoke and waste solution of plants, tobacco and raw sewage, kitchen garbage, etc., are general sources, and there are many various kinds of odors. In the home, odors from the toilet, kitchen, pets, tobacco, etc., can be unpleasant, irritating, etc. In particular, during the operation of an air conditioner or a heater, since a room is frequently closed, these offensive odors and abnormal odors cause problems.

[0003]

As such a conventional method for deodorizing offensive odors and abnormal odors, largely, there are the following methods (1)-(4).

(1) Sensual deodorizing method: A method that conceals offensive odors and abnormal odors by emitting an aroma from an aromatic material (aromatic refined oil, etc.) and makes them difficult to sense.

(2) Physical deodorizing method: A method that dilutes and removes offensive odors by ventilation and diffusion, or adsorbs offensive odors utilizing silica gel, activated carbon, etc., or includes odorous substances by an inclusion compound such as cyclodextrin.

[0004]

(3) Chemical deodorizing method: A method that deodorizes components of offensive odors and abnormal odors by chemical reaction. For example, a direct combustion method and an oxidizing method using an oxidizing agent such as ozone and potassium permanganate.

(4) Biological deodorizing method: A method that prevents spoiling by sterilizing microorganisms that generate the spoiling and preventing the generation of offensive odors.

[0005]

The above-mentioned sensual deodorizing method (1) is a method mainly carried out generally in homes; however, in the aromatic material, there is a limitation in the capability of removing odorous substances, and when an aroma and offensive odors are mixed, the balance of the aroma and the offensive odors is difficult to tolerate. Also, with the aroma, there are personal preferences, and sometimes it is unpleasant. The above-mentioned physical deodorizing method (2) has been broadly used, however there are problems in terms of device constitution, attachment and detachment of an odorous material due to the temperature change in an adsorber, and in maintenance.

[0006]

In the above-mentioned chemical deodorizing method (3), the selection of a material that effectively reacts with odorous substances in many various kinds of offensive odors, the method

is not practical in terms of safety of the chemicals used and there is concern of degradation with various types. The above-mentioned biological deodorizing method (4) is not appropriate for removing atmospheric odors, and the device constitution is required. Also, it takes time to exert the deodorizing effect.

[0007]

Thus, in the conventional deodorizing methods, there are merits and demerits (see Industrial Survey Group "New Deodorizing Technique" written by Susumu Kunibe (1981)). Thereupon, some of the present inventors attempted to use extracts obtained from plants as effective components for a deodorant, and as a result, a deodorant mainly composed of effective deodorizing components extracted from plants was developed and a patent has already been applied for it (see Japanese Kokai Patent Application No. Hei 1[1989]-218456, etc.).

[0008]

The effective deodorizing components extracted from plants are odorless in themselves and safe, and a large-scale facility as a deodorizing apparatus is not required. Thus, it will also be highly expected in the future.

[0009]

Problems to be solved by the invention

On the other hand, as mentioned above, various kinds of chemical deodorants as a liquid deodorant, for example, deodorants mainly composed of effective deodorizing components extracted from plants, were developed; however, since these deodorant themselves were nonvolatile, it could not be said that they were sufficient in terms of fast-acting property and deodorizing effect unless they were applied and directly used on the odor sources. Also, if effective odors still remain even in an infinitesimal amount, or after the deodorant and the offensive odors are mixed and the odor is unpleasant, it is difficult to call the deodorant a true deodorant.

[0010]

Considering such situations, the purpose of the present invention is to provide a deodorant that can exert an excellent fast-acting deodorizing effect to the above-mentioned offensive odors and abnormal odors, in particular, an organic acid group odor such as valeric acid and butyric acid, which are the main components of skin odor generated in shaver (electric razor), etc., sweat odor, body odor, and abnormal odor of socks, and that is not unpleasant after use.

[0011]



Means to solve the problems

In order to solve the above-mentioned problems, these inventors repeated various reviews. As a result, it was confirmed by experiments that if a specific kind of refined plant oil or its components were included, a fast-acting deodorizing effect was exerted by a sensually neutralizing action in which the aroma of the refined plant oil or its component was mixed with an organic acid group odor and mutually canceled each other and the odor after use was not unpleasant.

[0012]

Therefore, the deodorant spray for a shaver of the present invention is characterized by the fact that in a deodorant for an organic acid group odor, it includes at least one kind of refined plant oil or its component selected from a group comprised of lemongrass oil, orange oil, lemon oil, linalool, menthol, borneol, linalyl acetate, benzyl benzoate, citral, decylaldehyde, and terpinolene.

[0013]

The refined plant oil or its component is generally obtained by vapor distillation, pressing, etc., is volatile, and emits an aroma; however, its manufacturing method, etc., are not especially limited. The total content of refined plant oil or its component is not specially limited; however, 0.01-10 wt% to the entire deodorant is preferable. If the content exceeds the upper limit of the range, since the aroma of the refined plant oil or

its component is too strong, an unpleasant odor is likely to be produced by a masking operation, and if the content is less than the lower limit, the cancellation of the aroma and the odor is not likely to be exerted.

[0014]

In the deodorant of the present invention, if necessary, a perfume may also be included to further add to the aroma. In the deodorant of the present invention, if necessary, the component having a deodorizing effect due to a chemical reaction, for example, effective deodorizing components extracted from each organ, such as leaves, petioles, seeds, stems, roots, skins, etc., of plants, one or more kinds of organic acid(s) such as L-tartaric acid, maleic acid, succinic acid, malic acid, citric acid, and lactic acid, chemical materials such as glyoxal and oxidizing agents may also be included. In this case, the deodorant has a sensual deodorizing effect and chemical deodorizing effect. The content of the component having a chemical deodorizing effect is not especially limited; however, 0.01-20 wt% is preferable to the entire deodorant.

[0015]

As the kind of plant for obtaining effective deodorizing components extracted from plants, there is no limitation; however, for example, Oxalidaceae, Saururaceae, hemlock, ginkgo, black pine, Japanese larch, Japanese red pine, paulownia, *Osmanthus asiaticus*, lilac, *Osmanthus fragrans*, butterbur, Japanese silverleaf, weeping golden bell, etc., are preferable.

However, it is not necessary for it to be limited to them, and in addition to the above-mentioned plants, Oleaceae, pine plants, plant cell culture systems induced and cultured from these plants, etc., can be broadly used. Also, only one kind of plant may be used, or two kinds of plants may also be used. As a method for extracting effective deodorizing components from plants, there is no special limitation; however for example, as an extracting solvent, a hydrophilic organic solvent of alcohols such as ethanol and methanol, and ketones such as methyl ethyl ketone and acetone are added to the above-mentioned raw plant materials, and using a Soxhlet extractor, etc., effective deodorizing components are thermally extracted. As the extracting solvent, a mixed solvent of water and said hydrophilic organic solvent may also be used. The extracted solution obtained may be used as is or after diluting with an appropriate solvent, or enriching, or enriching and drying. As the effective deodorizing component, only one kind of component may also be used, or a mixture of two kinds or more may be used. Also, the extracting operation is not limited to one-stage extraction, and if necessary, using a hydrophobic organic solvent such as petroleum ether, hexane, ethyl acetate, etc., aromatic components such as grassy smell in the raw plant materials may be removed in advance by eluting. The aromatic components can also be removed by a vapor distillation method. The effective deodorizing components extracted from plants are generally nonvolatile.

[0016]

The deodorant of the present invention, if necessary, may also include a material having a deodorizing effect caused by an

inclusion, such as cyclodextran. If necessary, the deodorant of the present invention may also include a surfactant. As a usable surfactant, there is no special limitation, and any of cationic surfactant, anionic surfactant, amphoteric surfactant, and nonionic surfactant may be used.

[0017]

The deodorant of the present invention may also include an antibiotic as needed to prevent an offensive odor caused by an organic material in a material being deodorized, such as beard clippings attached to a shaver and microorganisms living in sebum and skin. As its concrete examples, there is no special limitation; however, for example, quaternary ammonium compounds such as benzalkonium chloride, cetylpyridinium chloride, sodium lauryl sulfate; phenol group compounds such as isopropylmethylphenol and resorcin, etc., are mentioned. Among them, in particular, benzalkonium chloride, cetylpyridinium chloride, isopropylmethylphenol, etc., are preferable. Also, as the antibiotic, an antibiotic that also serves as a surfactant may be used. Such an antibiotic is not especially limited, and for example, the above-mentioned quaternary ammonium compounds (cationic surfactants) such as benzalkonium chloride and cetylpyridinium chloride, sodium laurylsulfate (anionic surfactant), etc., are mentioned.

[0018]

When the deodorant includes the antibiotic, its content is not especially limited; however, 0.001-1 wt% to the entire

deodorant is preferable. As the antibiotic, only one kind of antibiotic may be used, or two or more kinds of antibiotics may be used. The deodorant of the present invention may include water, organic solvent, etc., also. As a usable organic solvent, there is no special limitation; however, for example, hydrophilic organic solvents such as alcohols such as methanol and ethanol, ketones such as methyl ethyl ketone and acetone, hydrophobic organic solvents of petroleum ether, hexane, ethyl acetate, etc., are mentioned.

[0019]

When the deodorant of the present invention is used for a shaver, it preferably includes liquid paraffin as a shaver oil. The reason for this is that when the liquid paraffin is included, after the shaver is washed, or after the shaver is used, the shaver can be used smoothly in an odorless state by spraying the deodorant of the present invention on the shaver. In other words, a lubrication effect that improves the slidability of inner and outer edges of the shaver is obtained by including the liquid paraffin, and it is also effective in terms of maintenance of the shaver.

[0020]

When the liquid paraffin is included, the content is not especially limited; however, 1-50 wt% is preferable to the entire deodorant. When the deodorant of the present invention includes the liquid paraffin, hexane is also preferably included. When the deodorant of the present invention is used as a deodorizing spray

as will be mentioned later, the liquid paraffin is usually injected into a spray can apart from the other components. At that time, the liquid paraffin as it is difficult to be injected into the spray can. Thereupon, if the liquid paraffin is diluted with hexane, the liquid paraffin is easily injected into the spray can. When the liquid paraffin is diluted with hexane, the amount of hexane used is not especially limited; however, about 0.5-2 parts by volume is preferable to the liquid paraffin at 1 part by volume.

[0021]

pH of the deodorant is not especially limited; however, in order to further raise the deodorizing ability and the safety, it is preferably adjusted from weak acidity to weak alkalinity (for example, about 5-8). As a method for adjusting the pH, there is no special limitation; however, for example, a method for adding alkali solution such as aqueous potassium hydroxide solution and aqueous sodium hydroxide solution, solution having a buffer action, etc., are mentioned.

[0022]

The method of use of the deodorant of the present invention is not especially limited; however, for example, a method that puts the deodorant into a spray container and uses it as a deodorizing spray, a method that uses the deodorant by impregnating with a porous carrier of inorganic substances and organic substances, etc., are mentioned. As the spraying type of method, there is no special limitation; however, for example, a

spraying-type method utilizing the pressure of one more propellants of LPG (liquefied petroleum gas), DME (dimethyl ether), propane gas, carbondioxide gas, compressed gas, etc., a type utilizing a negative pressure of a fluid such as spraying, a type utilizing the pressure from the outside of a container, etc., are mentioned. When the spraying agent is used, the amount ratio of the deodorant and the spraying agent is not especially limited. The shape, size, material, etc., of the spray container are also not especially limited.

[0023]

#### Function

If a specific kind of refined plant oil or its component having a sensual deodorizing effect for an organic acid group odor is included, the odor intensity is lowered by a sensual neutralizing action in which the aroma of the refined plant oil or its component and the organic acid group odor are mixed and mutually canceled. The degree of pleasantness is improved, while the degree of unpleasantness is decreased, so that an excellent fast-acting deodorizing effect is exerted. At the same time, the odor after use is not unpleasant.

[0024]

#### Application example

Next, the concrete application examples of the present invention and the comparative examples are shown; however, the

present invention is not limited to the following application examples.

#### Application Examples 1-6

Raw materials were mixed at a mixture shown in the following Table I, so that a liquid deodorant was prepared. Along with a propellant composed of LPG (liquefied petroleum gas) and DME (dimethyl ether), the deodorant was sealed at a weight ratio of deodorant:propellant = 24:76 in a spray container, so that a deodorizing spray was prepared.

[0025]

#### Comparative Examples 1-6

Raw materials were mixed at a mixture shown in the following Table II, so that a liquid deodorant was prepared. Using the deodorant obtained, a deodorizing spray was manufactured similarly to Application Examples 1-6.



[0026]

Table I

		(1)	(2)	(3)	(4)	(5)	(6)
		実例1	実例2	実例3	実例4	実例5	実例6
⑧ 精製植物油	⑨ レモン Grass 油	0.000	0.002	0.208	0.104	0.000	0.007
	⑩ オレンジ 油	0.218	0.000	0.019	0.038	0.000	0.000
	⑪ レモン 油	0.000	0.000	0.019	0.038	0.000	0.000
⑦ 香料成分	⑫ リナロール						
	⑬ メントール	0.001	0.002	0.018	0.036	0.036	0.000
	⑭ ボルネオール						
⑦ 香料成分	⑮ リナリル	0.001	0.010	0.100	0.200	0.200	0.000
	⑯ 安息香酸ベンジル						
	⑰ シトラール	0.005	0.005	0.045	0.090	0.090	0.000
⑦ 香料成分	⑱ デシルアルデヒド						
	⑲ デシルアルコール						
	⑳ 天然由来香料	15.012	0.000	0.000	0.000	0.834	0.417
⑦ 香料成分	㉑ 市販香料	0.000	10.005	0.417	1.668	0.834	0.000
	㉒ イソプロピルアルコール	0.156	0.850	0.083	0.000	0.083	0.000
	㉓ 酸化ベンジルコニウム	0.000	0.000	0.000	0.005	0.000	0.830
⑦ 香料成分	㉔ 松節パラフィン	15.325	6.250	25.000	1.050	12.500	26.000
	㉕ ヘキサン	5.120	3.337	6.672	0.000	3.336	6.672
	㉖ ステアロール	64.162	79.539	67.419	96.771	82.087	66.074
⑦ 合計		100.000	100.000	100.000	100.000	100.000	100.000

- Key: 1 Application Example 1  
 2 Application Example 2  
 3 Application Example 3  
 4 Application Example 4  
 5 Application Example 5  
 6 Application Example 6  
 7 Mixture of raw materials of deodorant (wt%)  
 8 Refined plant oil  
 9 Lemongrass oil  
 10 Orange oil  
 11 Lemon oil  
 12 Refined oil component  
 13 Linalool  
 14 Menthol  
 15 Borneol  
 16 Linalyl acetate  
 17 Benzyl benzoate  
 18 Citral  
 19 Decylaldehyde

- 20 Terpinolene.
- 21 Deodorant from natural substances
- 22 Deodorant on the market
- 23 Antibiotic
- 24 Isopropylmethylphenol
- 25 Benzalkonium chloride
- 26 Liquid paraffin
- 27 Solvent
- 28 Hexane
- 29 Ethanol
- 30 Total

Table II

		①	②	③	④	⑤	⑥
		比較例 1	比較例 2	比較例 3	比較例 4	比較例 5	比較例 6
① 消臭剤の原料の配合 (重量%)	⑧ 植物精油						
	⑨ レモングラス油	< 0.001	0.000	0.000	0.000		0.000
	⑩ オレンジ油	0.000	< 0.001	0.000	0.000	> 10.000	0.000
	⑪ レモン油	0.000	0.000	< 0.001	0.000		0.000
	⑬ リナロール						
	⑭ メントール	0.000	0.000	0.000		0.000	0.000
	⑮ ボルネオール						
	⑯ 酢酸リナリル	0.000	0.000	0.000	> 10.000	0.000	0.000
	⑰ 安息香酸ベンジル						
	⑱ シトラール						
② 精油成分	⑲ デシルアルデヒド	0.000	0.000	0.000		0.000	0.000
	⑳ テルピノレン						
	㉑ 天然物由来消臭物質	15.012	0.000	0.000	0.000	0.834	0.417
	㉒ 市販消臭剤	0.000	10.005	0.417	1.668	0.834	0.000
	㉓ イソプロピルメチルフェニール	0.156	0.850	0.083	0.000	0.083	0.000
	㉔ 塩化ベンザルコニウム	0.000	0.000	0.000	0.005	0.000	0.830
	㉕ 流動パラフィン	15.325	6.250	25.000	1.050	12.500	26.000
	㉖ ヘキサン	5.120	3.337	6.672	0.000	3.336	6.672
	㉗ エタノール	> 64.386	> 79.557	> 67.827	< 87.277	< 72.413	66.081
	㉘ 合計	100.000	100.000	100.000	100.000	100.000	100.000

Key: 1 Comparative Example 1  
 2 Comparative Example 2  
 3 Comparative Example 3

4	Comparative Example 4
5	Comparative Example 5
6	Comparative Example 6
7	Mixture of raw materials of deodorant (wt%)
8	Refined plant oil
9	Lemongrass oil
10	Orange oil
11	Lemon oil
12	Refined oil component
13	Linalool
14	Menthol
15	Borneol
16	Linalyl acetate
17	Benzyl benzoate
18	Citral
19	Decylaldehyde
20	Terpinolene
21	Deodorant from natural substances
22	Deodorant on the market
23	Antibiotic
24	Isopropylmethylphenol
25	Benzalkonium chloride
26	Liquid paraffin
27	Solvent
28	Hexane
29	Ethanol
30	Total

[0028]

However, in the above-mentioned Tables I and II, the deodorant from the natural substances is obtained by adding glyoxal and NaOH, which is a pH adjustor, using a thermal extract from weeping golden bell as a base. The deodorant on the market is FS-300W made by Shiraimatsu Shinyaku K.K. The deodorizing effect of each deodorant obtained in the above Application

Examples 1-6 and Comparative Examples 1-6 was investigated as follows.

[0029]

Six shavers each for the application example and comparative example were prepared, and for six adult males, half of the beard of their face was shaved by the shavers of the application example, and the other half of the beard was shaved by the shavers of the comparative example. After one week, the deodorant of each application example and comparative example was sprayed for 2 sec on the inner edges and outer edges of the shavers for the application example comparative example and maintained at room temperature for 24 h.

[0030]

Next, the odor of the shaver was evaluated by a panel of about 10 persons, and a functional test of the odor intensity and a functional test of the degree of pleasantness and unpleasantness were simultaneously carried out. The odor intensity was evaluated by the numerical sequence of 0, 1, 2, 3, 4, and 5. The odor intensity 0 means "no odor," and 1 means "odor that can be slightly sensed." 2 means "odor that is understood as a certain odor," and 3 means "odor that can be pleasantly sensed." 4 means "strong odor," and 5 means "very strong odor."

[0031]

Also, the degree of pleasantness and unpleasantness was evaluated by the numerical sequence of +4, +3, +2, +1, 0, -1, -2, -3, and -4. For the degree of pleasantness and unpleasantness, +4 means "extremely pleasant," and +3 means "very pleasant." +2 means "pleasant," and +1 means "slightly pleasant." 0 means "neither pleasant nor unpleasant," and -1 means "slightly unpleasant." -2 means "unpleasant," and -3 means "very unpleasant." -4 means "extremely unpleasant."

[0032]

These results were shown in the following Table III. Also, the results shown in Table III are average values of the above-mentioned panel of 10 persons. Also, when the shavers used in shaving the beard were not treated at all and maintained room temperature for 24 h, the odor intensity was 3.0, and the degree of pleasantness and unpleasantness was -3.5.

Table III

		① 臭気強度	② 快・不快度
③	実施例 1	0.2	+2.1
④	比較例 1	2.1	-1.6
⑤	実施例 2	0.2	+2.3
⑥	比較例 2	2.0	-1.5
⑦	実施例 3	0.3	+3.2
⑧	比較例 3	1.9	-0.9
⑨	実施例 4	0.2	+2.5
⑩	比較例 4	2.4	-2.1
⑪	実施例 5	0.4	+1.8
⑫	比較例 5	2.4	-2.1
⑬	実施例 6	0.2	+1.5
⑭	比較例 6	2.1	-2.2

Key: 1 Odor intensity  
 2 Degree of pleasantness and unpleasantness  
 3 Application Example 1  
 4 Comparative Example 1  
 5 Application Example 2  
 6 Comparative Example 2  
 7 Application Example 3  
 8 Comparative Example 3  
 9 Application Example 4  
 10 Comparative Example 4  
 11 Application Example 5  
 12 Comparative Example 5  
 13 Application Example 6  
 14 Comparative Example 6

[0034]

As seen from Table III, compared with the deodorants obtained in Comparative Examples 1-6, it was confirmed that the

deodorants obtained in Application Examples 1-6 were excellent in the deodorizing effect and that the odor after the reaction was not unpleasant.

[0035]

#### Effect of the invention

The deodorant of the present invention provides a deodorant that exerts an excellent fast-acting deodorizing effect caused by a sensual neutralizing action to offensive odors and abnormal odors, in particular, an organic acid group odor such as valeric acid and butyric acid, which are the main components of skin odor generated in a shaver (electric razor), etc., sweat odor, body odor, and abnormal odor of socks, and that is not unpleasant after use.